



<110> IWAKURA, Masahiro

<120> Sulfur Atom-Free Enzyme Protein

<130> 4853.0084

<140> US 10/019,409

<141> 2001-12-28

<150> PCT/ JP00/02112

<151> 2000-03-31

<150> JP/ 183664

<151> 1999-06-29

<160> 10

<170> PatentIn version 3.1

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<213> Escherichia coli

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Arg Asn Thr Leu Asn Lys Pro Val Ile Met Gly Arg His Thr Trp Glu  
35 40 45

Ser Ile Gly Arg Pro Leu Pro Gly Arg Lys Asn Ile Ile Leu Ser Ser  
50 55 60

Gln Pro Gly Thr Asp Asp Arg Val Thr Trp Val Lys Ser Val Asp Glu  
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Ala Ile Ala Ala Ala Gly Asp Val Pro Glu Ile Met Val Ile Gly Gly  
85 90 95

Gly Arg Val Tyr Glu Gln Phe Leu Pro Lys Ala Gln Lys Leu Tyr Leu  
100 105 110

Thr His Ile Asp Ala Glu Val Glu Gly Asp Thr His Phe Pro Asp Tyr  
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<222> (81)..(557)

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<213> Bacillus subtilis

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Val Val Asp Ser Trp Gly Thr Tyr Arg Pro Thr Gly Thr Tyr Lys Gly  
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Thr Val Lys Ser Asp Gly Gly Thr Tyr Asp Ile Tyr Thr Thr Thr Arg  
100 105 110

Tyr Asn Ala Pro Ser Ile Asp Gly Asp Arg Thr Thr Phe Thr Gln Tyr  
115 120 125

Trp Ser Val Arg Gln Ser Lys Arg Pro Thr Gly Ser Asn Ala Thr Ile  
130 135 140

Thr Phe Ser Asn His Val Asn Ala Trp Lys Ser His Gly Met Asn Leu  
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<222> (1)..(555)

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acc gga aat ttt gtt gtt ggt aaa ggt tgg act aca ggt tcg cca ttt 144  
Thr Gly Asn Phe Val Val Gly Lys Gly Trp Thr Thr Gly Ser Pro Phe  
35 40 45

agg acg ata aac tat aat gcc gga gtt tgg gcg ccg aat ggc aat gga 192  
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Ala Ile Ala Ala Ala Gly Asp Val Pro Glu Ile Phe Val Ile Gly Gly  
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Gly Arg Val Tyr Glu Gln Phe Leu Pro Lys Ala Gln Lys Leu Tyr Leu  
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Thr His Ile Asp Ala Glu Val Glu Gly Asp Thr His Phe Pro Asp Tyr  
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<222> (81)..(560)

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gcg Ala	caa Gln	aag Lys 110	ctt Leu	tat Tyr	ctg Leu	acg Thr	cat His 115	atc Ile	gat Asp	gca Ala	gaa Glu	gtg Val 120	gaa Glu	ggc Gly	gac Asp	449
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Glu	Asn	Ala	Leu 20	Pro	Trp	Asn	Leu	Pro 25	Ala	Asp	Leu	Ala	Trp 30	Phe	Lys
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Arg	Asn	Thr 35	Leu	Asn	Lys	Pro	Val 40	Ile	Tyr	Gly	Arg	His 45	Thr	Trp	Glu
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Ser	Ile 50	Gly	Arg	Pro	Leu	Pro 55	Gly	Arg	Lys	Asn	Ile 60	Ile	Leu	Ser	Ser
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 Gly Arg Val Tyr Glu Gln Phe Leu Pro Lys Ala Gln Lys Leu Tyr Leu  
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 Asn Tyr Ser Val Asn Trp Ser Asn Thr Gly Asn Phe Val Val Gly Lys  
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<212> DNA

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Ser Ile Gly Arg Pro Leu Pro Gly Arg Lys Asn Ile Ile Leu Ser Ser  
50 55 60

Gln Pro Gly Thr Asp Asp Arg Val Thr Trp Val Lys Ser Val Asp Glu  
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Ala Ile Ala Ala Ala Gly Asp Val Pro Glu Ile Phe Val Ile Gly Gly  
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Gly Arg Val Tyr Glu Gln Phe Leu Pro Lys Ala Gln Lys Leu Tyr Leu  
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Thr His Ile Asp Ala Glu Val Glu Gly Asp Thr His Phe Pro Asp Tyr  
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Glu Pro Asp Asp Trp Glu Ser Val Phe Ser Glu Phe His Asp Ala Asp  
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Ala Gln Asn Ser His Ser Tyr Ser Phe Glu Ile Leu Glu Arg Arg Gly  
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